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IS 9396-2 (2012): Round open top sanitary cans for foods and drink- Specification, Part 2: Sizes and general requirements [MTD 32: Metal Containers]

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भाग 2 साइज और सामान्य अपेक्षाएँ

(दूसरा पुनरीक्षण)

Indian Standard

ROUND OPEN TOP SANITARY CANS FOR FOODS AND DRINKS — SPECIFICATION

PART 2 SIZES AND GENERAL REQUIREMENTS

(Second Revision)

ICS 55.120;67.040;67.160.01

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

October 2012 **Price Group 3**

Metal Containers Sectional Committee, MTD 32

FOREWORD

This Indian Standard (Part 2) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Metal Containers Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1975 and subsequently revised in 1987. The Committee felt to revise this standard in the light of developments in the OTS can manufacturing practices and the experience gained by the processed food industry by the use of these cans. In this revision following modifications have been carried out:

a) Reference clause has been added;
b) Table 1 and Table 2 have been combined and made single Table 1;
c) New Table 3 has been added;
d) Clause **4.2** has been modified by permitting the OTS cans with welded side seam with suitable protective side stripe system. Provision of soldered side seam in the OTS cans manufacture has been deleted;
e) Requirements of solder have been deleted;
f) Clauses on internal finish and external finish have been modified; and
g) Clause on packing and condition of supply has been modified.

This standard has been issued in two parts. Other part in the series is:

Part 1 Tinplate requirements

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ROUND OPEN TOP SANITARY CANS FOR FOODS AND DRINKS — SPECIFICATION

PART 2 SIZES AND GENERAL REQUIREMENTS

(Second Revision)

1 SCOPE

This standard (Part 2) covers the definition, sizes, manufacturing and testing requirements of round open top sanitary (OTS) cans used for the packing of thermally and non-thermally processed foods and drinks.

2 REFERENCES

The following standards contains provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1993 : 2006/ ISO 11949 : 1985	Cold reduced electrolytic tinplate (*fourth revision*)
2471 : 1963	Methods of test for metal containers
9396 (Part 1) : 1987	Specification for round open top sanitary cans for foods and drinks: Part I Tinplate (*first revision*)
9976 : 1981	Method of sampling of open top sanitary (OTS) cans
11104 : 1984	Glossary of terms relating to open top sanitary cans
12219 : 1987	Methods of determination of gross-lidded capacity of open top sanitary cans

3 TERMINOLOGY

For the purpose of this standard, the terms given in IS 1993, IS 11104 and the following shall apply.

3.1 Open Top Sanitary Can — A rigid metal container which can be hermetically sealed for packing of thermally and non-thermally processed foods and drinks like fruit and vegetable products, synthetic beverages, meat and fish products, dairy products, instant coffee, instant tea, etc.

3.2 Punch Plug Diameter — The precise punch plug diameter of the tool used to produce the end components (*see* Fig. 1) of the can, measured to two decimal places of a millimetre.

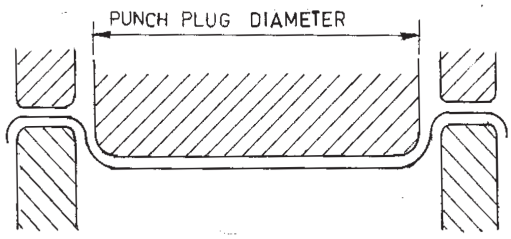


FIG. 1 PUNCH PLUG DIAMETER

4 REQUIREMENTS

4.1 Dimensions and Capacities

4.1.1 *Diameter*

The nominal diameters of the cans and the corresponding internal diameters shall be as given below:

Trade Size	*Nominal Diameter* mm	*Internal Diameter of Body* mm	*Punch Plug Diameter* mm	*Deviation on Punch Plug Diameter* (*see* Note) mm
(1)	(2)	(3)	(4)	(5)
202	52	52.30 ± 0.1	51.99	+0.05 for all diameters
211	65	65.45 ± 0.1	64.26	
300	73	72.80 ± 0.1	72.52	
307	83	83.40 ± 0.1	83.10	
401	99	98.90 ± 0.2	98.75	
404	105	105.10 ± 0.2	104.90	
502	127	126.50 ± 0.2	126.22	
509	138	138.40 ± 0.2	138.48	
603	153	153.40 ± 0.2	153.04	
700	174	174.10 ± 0.2	174.35	
901	227	227.27 ± 0.2	227.23	

NOTE — This deviation is given for the guidance of the manufacturer and should not be confused with manufacturing tolerances.

4.1.2 *Capacities and Tinplate Thickness*

The gross lidded capacities and the corresponding tinplate thicknesses of OTS cans shall be as given in Tables 1, 2 and 3. The gross lidded capacity shall be measured according to the method given in IS 12219.

4.2 Manufacture

4.2.1 Each component shall be made from a single piece of tinplate conforming to IS 9396 (Part 1). The can ends for both thermally and non-thermally processed food cans may also be made of tin free steel sheet lacquered externally and internally.

Table 1 Capacities and Tinplate Thickness for OTS Cans for Thermally and Non-thermally Processed Foods and Drinks

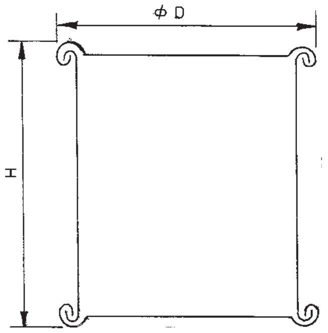
(*Clause* 4.1.2)

Sl No.	**Trade Size (*see* Note)**	**Trade Overseam Dimensions *D*×*H*** mm	**Nominal Diameter** mm	**Gross Lidded Capacity** ml	**Tinplate Thickness** Body mm	Ends mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	202 × 108	55 × 38	52	67 ± 3	0.19	0.19
ii)	202 × 308	55 × 89	52	171 ± 5	0.19	0.19
iii)	202 × 504	55 × 133	52	266 ± 6	0.19	0.19
iv)	211 × 400	68 × 102	65	310 ± 8	0.21	0.21
v)	211 × 410.5	68 × 118	65	366 ± 9	0.22	0.22
vi)	211 × 601	68 × 154	65	486 ± 12	0.22	0.22
vii)	300 × 203	76 × 56	73	200 ± 6	0.22	0.22
viii)	300 × 309	76 × 90	73	343 ± 9	0.22	0.22
ix)	300 × 409	76 × 116	73	452 ± 11	0.22	0.22
x)	301 × 109	77 × 40	74	130 ± 5	0.22	0.22
xi)	301 × 201	77 × 52	74	185 ± 6	0.22	0.22
xii)	301 × 203	77 × 56	74	198 ± 6	0.22	0.22
xiii)	301 × 206	77 × 60	74	219 ± 7	0.22	0.22
xiv)	301 × 303.5	77 × 82	74	311 ± 8	0.22	0.22
xv)	301 × 309	77 × 90	74	349 ± 9	0.22	0.22
xvi)	301 × 315	77 × 100	74	390 ± 10	0.22	0.22
xvii)	301 × 409	77 × 116	74	458 ± 11	0.22	0.22
xviii)	307 × 408	87 × 114	83	572 ± 11	0.22	0.22
xix)	401 × 206	102 × 60	99	400 ± 10	0.24	0.24
xx)	401 × 208	102 × 64	99	415 ± 10	0.24	0.24
xxi)	401 × 300	102 × 76	99	512 ± 11	0.24	0.24
xxii)	401 × 301.5	102 × 78	99	540 ±11	0.24	0.24
xxiii)	401 × 411	102 × 119	99	841 ± 17	0.24	0.24
xxiv)	404 × 206	108 × 60	105	450 ± 11	0.24	0.24
xxv)	509 × 703	141 × 183	138	2 605 ± 40	0.28	0.28
xxvi)	603 × 600	157 × 152	153	2 646 ± 30	0.28/0.30	0.26/0.27
xxvii)	603 × 700	157 × 178	153	3 100 ± 30	0.28/0.30	0.26/0.27
xxviii)	603 × 912	157 × 248	153	4 503 ± 50	0.28/0.30	0.26/0.27
xxix)	700 × 900	178 × 229	174	5 280 ± 52	0.29/0.30	0.27/0.28
xxx)	901 × 100 8	230 × 267	227	10 395 ± 104	0.32	0.32

NOTE — The trade sizes are included here because the canning trade is still more familiar with these. When the canning trade becomes fully familiar with metric nomenclature, the trade size coloumn shall be omitted.

Table 2 Capacities and Tinplate Thickness for OTS Cans for Non-thermally Processed Food Products

(*Clause* 4.1.2)



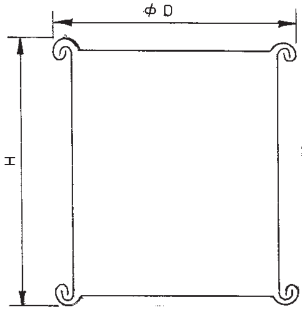
Trade Size	Trade Overseam Dimensions *D*×*H*	Nominal Diameter mm	Gross Lidded Capacity ml	Tinplate Thickness			Lid/Ends
				Body		Bottom End/Ring	
				Unbeaded mm	Beaded mm		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
300 × 203	76 × 56	73	200 ± 6	0.16 *DR*		0.18	0.16 *DR*
300 × 400	76 × 102	73	393 ± 10	0.16 *DR*		0.18	0.16 *DR*
301 × 203	77 × 56	74	206 ± 6	0.16 *DR*		0.18	0.16 *DR*
301 × 302	77 × 80	74	302 ± 8	0.16 *DR*	—	0.18	0.16 *DR*
301 × 302.25	77 × 80	74	304 ± 8	0.16 *DR*	—	0.18	0.16 *DR*
301 × 303.5	77 × 82	74	312 ± 8	0.16 *DR*	—	0.18	0.16 *DR*
301 × 400	77 × 102	74	404 ± 10	0.16 *DR*	—	0.18	0.16 *DR*
301 × 409	77 × 116	74	458 ± 11	0.16 *DR*		0.18	0.16 *DR*
307 × 408	87 × 114	83	572 ± 11	0.16 *DR*	—	0.18	0.16 *DR*
307 × 414	87 × 124	83	626 ± 12	0.16 *DR*	0.20	0.18	0.16 *DR*
401 × 404	102 × 108	99	769 ± 16	0.16 *DR*		0.18	0.16 *DR*
401 × 407	102 × 113	99	796 ± 16	0.16 *DR*	0.19	0.18	0.16 *DR*
401 × 407.5	102 × 114	99	802 ± 16	0.16 *DR*	0.19	0.18	0.16 *DR*
401 × 412	102 × 121	99	882 ± 18	0.16 *DR*	0.19	0.18	0.16 *DR*
401 × 504	102 × 133	99	957 ± 19	0.16 *DR*	0.19	0.18	0.16 *DR*
401 × 604	108 × 159	99	1152 ± 23	0.16 *DR*	0.19	0.18	0.16 *DR*
404 × 212	108 × 10	105	526 ± 12	0.16 *DR*	—	0.18	0.16 *DR*
404 × 404	108 × 108	105	865 ± 18	0.16 *DR*		0.18	0.16 *DR*
404 × 412	108 × 121	105	968 ± 19	0.16 *DR*	0.19	0.18	0.16 *DR*
404 × 504	108 × 133	105	1 079 ± 21	0.16 *DR*	0.19	0.18	0.16 *DR*
404 × 510	108 × 143	105	1 162 ± 23	0.16 *DR*	0.19	0.18	0.16 *DR*
404 × 512	108 × 146	105	1 189 ± 24	0.16 *DR*	0.19	0.18	0.16 *DR*
502 × 500	130 × 127	127	1 479 ± 22	—	0.20	0.20	0.20
502 × 601	130 × 154	127	1 819 ± 27	—	0.20	0.20	0.20
502 × 605	130 × 160	127	1 899 ± 29	0.22	0.20	0.20	0.20
509 × 502	141 × 130	138	1 816 ± 27	0.22	0.20	0.22	0.20
509 × 601	141 × 154	138	2 175 ± 27	0.22	0.20	0.22	0.20
700 × 611	178 × 170	174	3 819 ± 38	0.24	0.22	0.22	0.20
700 × 800[1)]	178 × 203	114	4 613 ± 46	0.26	0.22	0.22	0.22
700 × 800	178 × 203	174	4 613 ± 46	0.26	0.24	—	0.24

[1)] For baby food only.

Table 3 Tinplate Thickness for OTS Thermally and for Non-thermally Cans for Foods and Drinks

(*Clause* 4.1.2)

All dimensions in millimetres.



Trade Size (Diameter of Can)	Trade Over-seam Diameter *D*	Nominal Diameter	Tinplate Thickness for Thermally Processed Foods				Tinplate Thickness for Non-thermally Processed Foods			
			Flattened Body	Built-up Can Body		Ends	Body Thickness		Bottom End/Ring Thickness	Lid/End Thickness
				Beaded	Unbeaded		Unbeaded	Beaded		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
202	55	52	0.19	0.18	0.19	0.19	—	—	—	—
211	68	65	0.20	0.19	0.20	0.20	—	—	—	—
300	76	73	0.21	0.19	0.21	0.21	0.19 or 0.17 *DR*	0.18 or 0.15 *DR*	0.18 or 0.17 *DR*	0.18 or 0.16 *DR*
307	87	83	0.22	0.20	0.22	0.22	0.20	0.18	0.18	0.18
401 × up to 301.5	102	99	0.22	—	0.22	0.22	0.19	0.18	0.18	0.18
								0.15		
401 × above 301.5	102	99	0.24	0.22	0.24	0.22	0.19	0.18	0.18	0.18
404	108	105	0.24	0.22	0.24	0.24	0.20	0.18	0.18	0.18
502	130	127	—	—	—	—	0.22	0.20	0.20	0.20
509	141	138	0.28	0.26	0.28	0.26	0.22	0.20	0.22	0.20
603 up to 700[1]	157	153	0.28	0.26	0.28	0.26	—	—	—	—
603 above 700[1]	157	153	0.28	0.28	0.28	0.26	—	—	—	—
700	178	174	0.29	0.28	0.28	0.28	0.26	0.22	0.22	0.22
901	230	227	0.30	0.30	0.30	0.30	—			

NOTES

1 Canning trade size normally referred as $D \times H$. Where D is the over seam diameter and H is the over seam height as shown in the above Figure.

2 Can height shall be maintained as per the mutual understanding between the seller and the buyer.

3 The nominal gross lidded capacity or nominal filling capacity shall be calculated according to the method given in the IS 12219.

4 The tin plate thickness indicated in this table is only for reference. Lower tin coating and tin plate (Material) thickness may be used as agreed between buyer and seller.

[1] The trade sizes are included here because the canning trade is still more familiar with these. When the canning trade becomes fully familiar with metric nomenclature, the trade size coloumn will be omitted.

4.2.2 The side seam shall be soldered or welded as shown in Fig. 2. The welded seam shall be internally and externally coated with a suitable side stripe lacquer to prevent it from rusting.

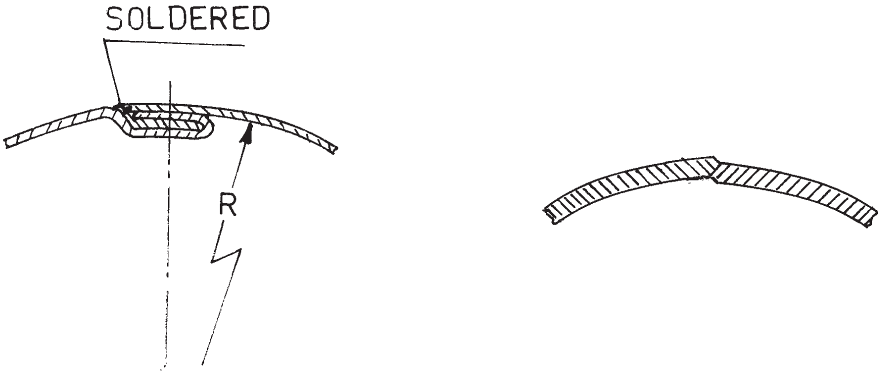
NOTE — Superwima and wima type weldings with maximum pre-weld overlap of 0.4 mm and 0.8 mm respectively are recommended for the welding of side seams but for non-thermally processed foods, butterfly type welding may also be used.

4.2.2.1 *Solder*

The solder used in the fabrication of the cans shall be non-antimonial quality with either 2 parts of tin and 98 parts of lead or 38 parts of tin and 62 parts of lead. Other solders may be used, if agreed to between the purchaser and the supplier.

4.2.3 The ends shall be lined with a suitable lining compound and double seamed as shown in Fig. 3. The lining compound used shall be non-toxic, compatible with the product packed, shall not impart off flavour and shall be resistant to the processing conditions.

4.2.4 The cans shall be new and in clean condition inside and outside.



SOLDERED JOINT

WELDED JOINT

FIG. 2 SIDE SEAM

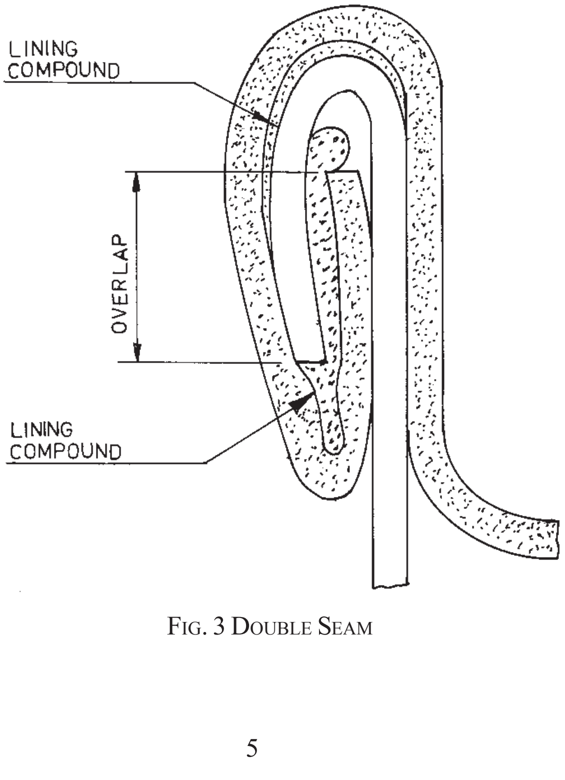


FIG. 3 DOUBLE SEAM

4.3 Internal Finish

The internal surface of the can may be given a protective coating with a suitable lacquer.

4.4 External Treatment

The outside surface of the can shall be lacquered or lithographed. Side seam soldered cans shall be protected with a suitable lacquer/varnish externally. If the treatment is done during can fabrication, it shall be resistant to the canning conditions.

5 AIR PRESSURE TEST FOR THERMALLY PROCESSED FOOD CANS

5.1 The test can with both ends seamed shall be first immersed in boiling water for a period of 5 min and then subjected to an internal air pressure test (*see* IS 2471) as specified below for a period of 15 s.

Can Diameter mm	*Pressure* kPa
Up to and including 99	100
Over 99	70

The can shall not show any signs of leakage when tested in water.

6 PACKING AND CONDITIONS OF SUPPLY

The can bodies may either be packed in flattened condition with both ends loose or with one end seamed on and other end. The flattened bodies, built up cans and ends shall be packed in suitable cartons/ wooden cases.

7 MARKING

7.1 The cans may be marked with the manufacturer's identification code showing source, year and quarter of the year of manufacture, and any other details as agreed to between the purchaser and the supplier. The marking on the cans shall be done in such a manner that it does not lead to any contamination or deterioration of the food packed in the can.

7.2 BIS Certification Marking

The open top sanitary cans may also be marked with the Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or produers may be obtained from the Bureau of Indian Standards.

8 SAMPLING

For ascertaining the conformity of the cans to this Indian Standard, the cans shall be tested by taking the number of samples according to the details laid down in IS 9976.

Bureau of Indian Standards

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Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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